

Design Element				Manual Section	2-Lane						
Design Controls	Design Year Traffic	AADT		40-2.01	< 50	50 ≤ AADT < 250	250 ≤ AADT < 400	400 ≤ AADT < 1500	1500 ≤ AADT < 2000	≥ 2000	
	Design Forecast Year			40-2.02	20 years						
	*Design Speed (km/h) (3)	Level		40-3.0	50 - 90	50 - 90	60 - 90	80 - 90	80 - 90	80 - 90	
		Rolling			50 - 90	50 - 90	50 - 90	60 - 90	60 - 90	60 - 90	
	Access Control			40-5.0	None						
	Level of Service			40-2.0	Desirable: B; Minimum: D						
Cross Section Elements**	Travel Lane	*Width		45-1.01	3.0 m	3.0 m	3.0 m (4a)	3.3 m	3.3 m(4b)	3.6 m	
		Typical Surface Type		Chp. 52	Asphalt / Concrete / Aggregate						
	Shoulder	*Width Usable		45-1.02	0.6 m	0.6 m	0.6 m	1.8 m (5)	1.8 m	2.4 m	
		Typical Surface Type		Chp. 52	Asphalt / Aggregate / Earth						
	Cross Slope	*Travel Lane (6)		45-1.01	2%-3% Asphalt / Concrete; 6% Aggregate						
		Shoulder		45-1.02	4%-6% Asphalt / Concrete; 6%-8% Aggregate: 8% Earth						
	Auxiliary Lanes	Lane Width		45-1.03	Same as Travel Lane			Des: Same as Travel Lane; Min: 3.0 m			
		Shoulder Width			Desirable: 1.2 m; Minimum: 0.6 m						
	Clear Zone			49-2.0	(7)						
	Side Slopes	Cut	Foreslope	45-3.0	4:1 (V > 60) (8); 3:1 (V # 60) (8)						
			Ditch Width		Des: 1.2 m; Min: 0.0 m						
			Backslope		4:1 (V > 60); 3:1 (V # 60) (9)						
		Fill	0-9 m Height	45-3.0	Desirable: 4:1; Maximum: 3:1						
			>9 m Height		3:1						
			Bridges**	New and Reconstructed Bridges	*Structural Capacity		Chp. 60	HS-20			
	*Clear Roadway Width (10)				45-4.01	Travelway + 1.2 m			Travelway + 1.8 m		Full Paved Approach Width
Existing Bridges to Remain in Place	*Structural Capacity			Chp. 60	HS-10	HS-15					
	*Clear Roadway Width (11)			45-4.01	6.0 m		6.6 m		7.2 m	8.4 m	
*Vertical Clearance (Local Road Under)	New and Replaced Overpassing Bridges (12)			44-4.0	4.45 m						
	Existing Overpassing Bridges				4.30 m						
Vertical Clearance (Local Road Over Railroad) (13)				Chp. 69	7.00 m						

*Controlling design criteria (see Section 40-8.0). ** Selection of the cross section and bridge elements is based on the design year traffic volumes irrespective of the design speed.
Des: Desirable. Min: Minimum.

GEOMETRIC DESIGN CRITERIA FOR LOCAL RURAL ROADS ⁽¹⁾
(New Construction / Reconstruction)

Table 53-5

Design Element			Manual Section	2-Lane						
Alignment Elements	Design Speed			30 km/h	40 km/h	50 km/h	60 km/h	70 km/h	80 km/h	90 km/h
	*Stopping Sight Distance		42-1.0	35 m	50 m	65 m	85 m	105 m	130 m	160 m
	Decision Sight Distance	Speed / Path / Direction Chg.	42-2.0	90 m	120 m	145 m	170 m	200 m	230 m	270 m
		Stop Maneuver		40 m	50 m	70 m	95 m	115 m	140 m	170 m
	Passing Sight Distance		42-3.0	200 m	270 m	345 m	410 m	485 m	540 m	615 m
	Intersection Sight Distance		46-10.0	65 m	85 m	105 m	150 m	150 m	170 m	190 m
	*Minimum Radii (e=8%)		43-2.0	30 m	55 m	85 m	125 m	180 m	230 m	305 m
	*Superelevation Rate		43-3.0	emax=8% (14)						
	*Horizontal Sight Distance		43-4.0	(15)						
	*Vertical Curvature (K-values)	Crest	44-3.0	2	4	7	11	17	26	39
		Sag		6	9	13	18	23	30	38
	*Maximum Grade	Level	44-1.02	8%	7%	7%	7%	7%	6%	5.5%
		Rolling		11%	11%	10%	9%	9%	8%	7%
Minimum Grade		44-1.03	Desirable: 0.5%; Minimum: 0.0%							

* Controlling design criteria (see Section 40-8.0).

These standards are to be used for all Federal-aid funded projects on local agency rural local roads classified as new construction/reconstruction. Deviations from controlling Level One design criteria should be covered by a design exception approved by the Chief, Division of Design.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROADS⁽¹⁾
(New Construction/Reconstruction)
Table 53-5 (Continued)

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROADS (New Construction/Reconstruction)

Footnotes to Table 53-5

- (1) Applicability. This table is only applicable to Federal-aid projects.
- (2) (Blank).
- (3) Design Speed. The minimum design speed should equal the minimum value from the table or the anticipated posted speed limit after construction, whichever is greater. The state legal limit is 90 km/h on non-posted highways.
- (4) Travel Lane Width. The following will apply:
 - a. Use 3.3 m lanes where $V \geq 90$ km/h.
 - b. Use 3.6 m lanes where $V \geq 90$ km/h.
- (5) Shoulder Width. The following will apply:
 - a. For $400 \leq \text{AADT} < 1500$, the shoulder width may be 1.2 m.
 - b. Usable shoulder width is defined as the distance from the edge of the travel lane to the shoulder break point.
- (6) Cross Slope (Travel Lanes). Cross slopes of 1.5% are acceptable on existing bridges to remain in place.
- (7) Clear Zone. The clear zone will vary according to design speed, traffic volumes, side slopes and horizontal curvature. See Section 49-2.0. For design speeds less than 80 km/h, a 3.0 m clear zones may be used.
- (8) Foreslope. See Sections 49-2.0 and 49-3.0 for the lateral extent of the foreslope in a ditch section.
- (9) Backslopes. Backslopes for rock cuts will vary according to the height of the cut and geotechnical factors.
- (10) Width (New and Reconstructed Bridges). Widths of bridges more than 30 m in length will be analyzed individually. At a minimum, the roadway width of these bridges will be the width of travel lanes plus a 0.9-m right shoulder and 0.9-m left shoulder for highways with $\text{AADT} > 2000$. Where shoulders are paved, it is desirable to provide the full approach roadway width. See Section 59-1.0 for more information on bridge widths.
- (11) Width (Existing Bridges to Remain in Place). Minimum clear widths that are 0.6 m narrower may be used on roads with few trucks. The clear roadway width should be at least the same width as the approach travelway. For one-lane bridges, the width may be 5.4 m. For bridges of more than 30 m in length, the values in the table do not apply. The acceptability of these bridges will be assessed individually.
- (12) Vertical Clearance (Local Road Under). Table values include an additional 150-mm allowance for future pavement overlays. Vertical clearances apply from usable edge to usable edge of shoulders.
- (13) Vertical Clearance (Local Road Over Railroad). See Chapter Sixty-nine for additional information on railroad clearances under highways.

- (14) Superelevation Rate. See Section 43-3.0 for values of superelevation based on design speed and radii.
- (15) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius and the sight distance which applies at the site. See Section 43-4.0.